

$^{181}\text{Ta}(\text{p},\text{d}) \quad \text{2002We01,1983Wa01}$ 

| Type            | Author          | History                             |
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$J^\pi(^{181}\text{Ta})=7/2^+$ .

2002We01: E(p)=22 MeV. Measured deuteron spectra at  $40^\circ$  with Q3D spectrometer (FWHM=4 keV).

1983Wa01, 1979Wa05, 1978Wa17: E(p)=19 MeV. Measured  $\sigma(\theta)$  using magnetic spectrometer and four solid state position sensitive detectors (FWHM $\leq$ 15 keV); DWBA analysis.

Others: 1974KhZX, 1975IsZW.

Additional information 1.

 $^{180}\text{Ta}$  Levels

| E(level) <sup>†</sup> | $J^\pi$ <sup>†</sup> | $L$ <sup>‡</sup> | $C^2S^{\#}$       | E(level) <sup>†</sup> | $J^\pi$ <sup>†</sup> | $L$ <sup>‡</sup> | $C^2S^{\#}$          | E(level) <sup>†</sup> | $J^\pi$ <sup>†</sup> | $L$ <sup>‡</sup> | $C^2S^{\#}$ |
|-----------------------|----------------------|------------------|-------------------|-----------------------|----------------------|------------------|----------------------|-----------------------|----------------------|------------------|-------------|
| 0.0 <sup>a</sup>      | 1 <sup>+</sup>       | 4                | 1.4               | 576.8 <sup>b</sup>    | 6 <sup>-</sup>       | 3                | 0.67                 | 808.5 <sup>f</sup>    | (5 <sup>-</sup> )    |                  |             |
| 39.8 <sup>a</sup>     | 2 <sup>+</sup>       | 4                | 1.7               | 596.6 <sup>a</sup>    | 10 <sup>+</sup>      |                  |                      | 836.4 <sup>e</sup>    | 5 <sup>-</sup>       | 3                | 0.67        |
| 78.0 10               | 9 <sup>-</sup>       |                  |                   | 600.3 <sup>a</sup>    | 7 <sup>+</sup>       |                  |                      | 876.5 <sup>f</sup>    | (2 <sup>-</sup> )    |                  |             |
| 111.1 <sup>a</sup>    | 3 <sup>+</sup>       | 6                | 1.7               | 646.3 <sup>d</sup>    | (4 <sup>-</sup> )    |                  |                      | 884.5                 |                      |                  |             |
| 178.9 <sup>a</sup>    | 8 <sup>+</sup>       | 5(+6)            | 0.91 <sup>@</sup> | 654.1                 |                      |                  |                      | 891.3                 |                      |                  |             |
| 185.6 <sup>a</sup>    | 4 <sup>+</sup>       |                  | 0.91              | 658.4 <sup>b</sup>    | (4 <sup>-</sup> )    | 3                | 1.1 <sup>&amp;</sup> | 895.0                 |                      |                  |             |
| 310.8 <sup>a</sup>    | 5 <sup>+</sup>       | 6                | 0.91              | 663.3 <sup>d</sup>    | (4 <sup>-</sup> )    |                  | 1.1                  | 907.7 <sup>e</sup>    | 4 <sup>-</sup>       | 1                | 1.2         |
| 375.8 <sup>a</sup>    | 9 <sup>+</sup>       | 6                | 1.2               | 680.5                 |                      |                  |                      | 914.5                 |                      |                  |             |
| 416.5 <sup>a</sup>    | 6 <sup>+</sup>       |                  |                   | 682.7 <sup>c</sup>    | 8 <sup>-</sup>       |                  |                      | 952.6                 |                      |                  |             |
| 423.2 <sup>b</sup>    | 1 <sup>-</sup>       | 3                | 0.77              | 717.3                 |                      |                  |                      | 973.0                 |                      |                  |             |
| 425.8                 |                      |                  |                   | 722.3 <sup>e</sup>    | 4 <sup>-</sup>       | 1                | 1.1                  | 977.3 <sup>b</sup>    | 8 <sup>-</sup>       |                  |             |
| 465.2 <sup>c</sup>    | 7 <sup>-</sup>       |                  |                   | 733.4                 |                      |                  |                      | 986.2                 |                      |                  |             |
| 477.4 <sup>b</sup>    | 2 <sup>-</sup>       | 3                | 1.2               | 758.1                 |                      |                  |                      | 1003.7                |                      |                  |             |
| 544.0 <sup>b</sup>    | 3 <sup>-</sup>       | 3                | 0.83              | 763.6 <sup>b</sup>    | 7 <sup>-</sup>       | 3                | 1.0                  | 1062.6                |                      |                  |             |
| 548.4 <sup>d</sup>    | 3 <sup>-</sup>       |                  |                   | 784.0 <sup>d</sup>    | (5 <sup>-</sup> )    |                  |                      | 1075.9                |                      |                  |             |
| 572.2                 |                      |                  |                   | 788.0 <sup>e</sup>    | 3 <sup>-</sup>       | 1                | 1.0                  | 1080.0                |                      |                  |             |

<sup>†</sup> From 2002We01.

<sup>‡</sup> From comparison of measured angular distributions with DWBA calculations (1983Wa01).

<sup>#</sup>  $C^2S=(1/N)(\sigma(\text{exp})/\sigma(\text{DWBA}))$ , N=2.29 (1983Wa01).

<sup>@</sup> Possible contribution from the 186,  $J^\pi=4^+$  level.

<sup>&</sup> Possible contribution from the 663,  $J^\pi=(4^-)$  level.

<sup>a</sup> 9/2<sup>+</sup>[624] neutron transferred.

<sup>b</sup> 5/2<sup>-</sup>[512] neutron transferred.

<sup>c</sup> 7/2<sup>-</sup>[514] neutron transferred.

<sup>d</sup> 1/2<sup>-</sup>[510] neutron transferred.

<sup>e</sup> 1/2<sup>-</sup>[521] neutron transferred.

<sup>f</sup> 3/2<sup>-</sup>[512] neutron transferred.